

# Women's use of complementary and alternative medicine products and services during pregnancy: Insights for safe, informed maternity care

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Technology Sydney

## **Certificate of original authorship**

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

**Signature of Student:**

A handwritten signature in dark ink, reading "Jane Frawley". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

Jane Elizabeth Frawley

June 2015

## **Statement of contributions to jointly authored works contained in the thesis**

The results from this thesis have been submitted for publication in peer-reviewed journals through five discrete manuscripts, presented in Chapters 4 through 8. For each of these papers, I have been primarily responsible for determining the research question, undertaking the analysis and drafting the manuscript.

I have received support in all of these areas by Professor Jon Adams, Professor David Sibbritt and Dr Jon Wardle. Dr Amie Steel has also assisted with data interpretation and final stages of manuscript drafting as needed. Professor Alex Broom and Professor Cindy Gallois have provided additional support with drafting and finalising the submitted/published manuscripts contained within this thesis.

I take full responsibility in the accuracy of the findings presented in these publications and this thesis.

## **Published works by the author incorporated into the thesis**

Of the drafted manuscripts contained in this thesis, all have been submitted for publication of which two are published, two have been resubmitted with revisions and one is one under review. Following is the list of manuscripts contained in this thesis:

1. Frawley J, Adams J, Sibbritt D, Steel A, Broom A, Gallois C (2013). Prevalence and determinants of complementary and alternative medicine (CAM) use

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2. Frawley J, Adams J, Broom A, Steel A, Gallois C, Sibbritt D. Majority of women are influenced by non-professional information sources when deciding to consult a complementary and alternative medicine (CAM) practitioner during pregnancy. *J Alt Comp Med*, 20(7): 571-577.
3. Frawley J, Adams J, Sibbritt D, Steel A, Broom A, Gallois C. (Under review). Women's attitudes towards the use of complementary and alternative medicine products during pregnancy. *Journal of Obstetrics & Gynaecology* (Resubmitted with revisions 25/03/2015).
4. Frawley J, Adams J, Steel A, Broom A, Gallois C, Sibbritt D (2015). Women's Use and Self-Prescription of Herbal Medicine during Pregnancy: An Examination of 1,835 Pregnant Women. *Women's Health Issues* (doi: 10.1016/j.whi.2015.03.001 Epub ahead of print).
5. Frawley J, Sibbritt D, Broom A, Gallois C, Steel A, Adams J. (Under review). Complementary and alternative medicine practitioner use prior to pregnancy predicts use during pregnancy: A longitudinal analysis. *Women & Health* (resubmitted with revisions 06/06/2015).

## Other relevant published works by the author not forming part of the thesis

### Journal articles

1. Frawley J, Sundberg T, Steel A, Sibbritt D, Broom A, Adams J (2015). Prevalence and characteristics of women who consult with osteopathic practitioners during pregnancy; a report from the Australian Longitudinal Study on Women's health (ALSWH). *Journal of Bodywork and Movement Therapies*, (In press).  
<http://dx.doi.org/10.1016/j.jbmt.2015.03.004>
2. Adams J, Frawley J, Steel A, Broom A, Sibbritt D (2015). Use of pharmacological and non-pharmacological pain management techniques and their relationship to maternal and infant birth outcomes: Examination of a 1,835 nationally representative sample of pregnant women. *Midwifery* 31(4): 458-463.
3. Leach M, McIntyre E, Frawley J. (2014). Characteristics of the Australian complementary and alternative medicine (CAM) workforce. *Aust J Herb Med*, 26(2): 58-65.
4. Steel A, Frawley J, Adams J, Diezel H. (2015). Trained or Professional Doulas in the Support and Care of Pregnant and Birthing Women: A Critical Integrative Review. *Health and Social Care in the Community* 23(3): 225-241.
5. Steel A, Adams J, Sibbritt D, Broom A, Gallois C, Frawley J. (2012). Utilisation of complementary and alternative medicine (CAM) practitioners within maternity

- care provision: results from a nationally representative cohort study of 1,835 pregnant women. *BMC Pregnancy Childbirth*, 12(1): 146.
6. Steel A, Adams J, Sibbritt D, Broom A, Gallois C, Frawley J. (2014). Determinants of women consulting with complementary and alternative medicine practitioner for pregnancy-related health conditions. *Women & Health*, 54(2): 127-44.
  7. Steel A, Adams J, Sibbritt D, Broom A, Frawley J., Gallois C. (2014). The influence of complementary and alternative medicine use in pregnancy on labour pain management choices: results from a nationally-representative study of 1,835 women. *J Altern Complement Med*, 20(2): 87-97.
  8. Steel A, Adams J, Sibbritt D, Broom A, Gallois C, Frawley J. (2013). Managing the pain of labour: the role of CAM and other factors in influencing the use of labour pain management in Australian women. *Health Expect.* (In Press: accepted 28 October 2013). DOI:10.1111/hex.12155
  9. Steel A, Adams J, Sibbritt D, Broom A, Frawley J., Gallois C. (2014). Relationship between complementary and alternative medicine use and incidence of adverse birth outcomes: An examination of a nationally-representative sample of 1835 Australian women. *Midwifery* 30(12): 1157-1165.
  10. Steel A, Frawley J., Sibbritt D, Adams J. (2013). A preliminary profile of Australian women accessing doula care: findings from the Australian

Longitudinal Study on Women's Health. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 53(6): 589-592.

11. Steel A, Frawley J, Dobson A, Jackson C, Lucke J, Tooth L, Brown W, Byles J, Mishra G. (2013). Women's health in NSW – a life course approach: an Evidence Check rapid review brokered by the Sax Institute. NSW Ministry of Health. <https://www.saxinstitute.org.au/wp-content/uploads/Womens-health-in-NSW2.pdf>
12. Peng W, Adams J, Sibbritt D, Frawley J. (2013). Critical review of complementary and alternative medicine use in menopause: focus on prevalence, motivation, decision-making, and communication. *Menopause*, 21(5): 536-548.
13. Frawley J, Finney-Brown T. (2013). Writing for case studies. *Aust J Herb Med*, 25(3): 138-140.
14. Grant, S, Frawley J, Bensoussan A. (2015). Process of care in outpatient Integrative health care facilities: a systematic review of clinical trials. *BMC Health Services Research* (In Press).
15. Murthy V, Sibbritt D, Broom A, Frawley J, Refshauge K, Adams J. Back pain sufferers' attitudes towards consultations with CAM practitioners and self-prescribed CAM products: a study of a nationally representative sample of

1,310 Australian women aged 60-65 years. (Under review at *Complementary Therapies in Medicine*).

16. Steel A, Adams J, Frawley J, Broom A, Sibbritt D. (2015). The characteristics of women who birth at home, in a birth centre or a hospital setting: A study of a nationally-representative sample of 1835 pregnant women. *Sexual & Reproductive Healthcare*. In press:  
<http://dx.doi.org/10.1016/j.srhc.2015.04.002>
17. Adams J, Steel A, Frawley J, Broom A, Sibbritt D. Substantial out-of-pocket expenditure on health care practitioner consultations and treatments during pregnancy: Estimates from a nationally-representative sample of pregnant women in Australia. (Under review at *Australian and New Zealand Journal of Obstetrics and Gynaecology*).
18. Steel A, Adams J, Frawley J, Wardle J, Broom A, Sidebotham M, Sibbritt D. The relationship between Australian women's health insurance coverage and their choice of maternity care provision: an examination of unintended consequences of health policy based on national data (Under review at *Health Services Research*).



## Scholarly book chapters

1. Frawley J (2014), Food allergy/Intolerance in Jerome Sarris and Jon Wardle, J Clinical Naturopathy, 2nd edition, Elsevier, Melbourne.
2. Steel A. Frawley J, Adams J, Sibbritt D, Broom A. (2013) Primary Health Care, Complementary and Alternative Medicine and Women's Health: A Focus Upon Menopause. In (Eds: Adams J) "Primary Health Care and Complementary and Integrative Medicine: Research and Practice. Imperial College Press, London.
3. Adams J, Sibbritt D, Broom A, Wardle J, Steel A, Murthy V and Daley J. (2012) Research capacity building in traditional, complementary and integrative medicine: grass-roots action towards a broader vision in "Traditional, Complementary and Alternative Medicine: An International Reader" (Eds: Adams J, Andrews G, Barnes J, Broom A and Magin P) Palgrave MacMillan, London.

## Published conference abstracts

1. Steel A, Sibbritt D, Adams J, Frawley J, Broom A, Gallois C (2014). The Association Between Women's Choice of Birth Setting and Their Use of CAM During Labor and Birth. *The Journal of Alternative and Complementary Medicine*, 20(5): A20-A20
2. Steel A, Adams J, Broom A, Sibbritt D, Frawley J (2014). Marginalization and Companionable Silence: CAM Practitioners' Perspectives of Their

Interprofessional Relationships with Maternity Care Providers. *The Journal of Alternative and Complementary Medicine*, 20(5):A111-A111

3. Frawley J, Adams J, Sibbritt D, Steel A, Broom A (2013) Young women's use of complementary and alternative medicine (CAM) products for chronic health conditions: results from a nationally representative survey of 8,009 women. *Forschende Komplementarmedizin* 20(suppl 1), 22
4. Adams J, Sibbritt D, Davidson P, Steel A, Broom A, Frawley J (2013) Diabetic women and their use of complementary and alternative medicine (CAM): A large, nationally-representative sample of mid-aged Australian women. *Forschende Komplementarmedizin* 20(suppl 1):1
5. Steel A, Adams J, Sibbritt D, Broom A, Frawley J. The influence of complementary and alternative medicine use in pregnancy on pain management in labour and birth outcomes. *Forsch Komplementmed*. 2013;20(suppl 1), 41
6. Frawley J, Adams J, Sibbritt D, Steel A, Broom A (2013) Self-care practices of women using Complementary and Alternative Medicine (CAM) in pregnancy: A nationally representative sample of 1,835 women. *Forsch Komplementmed*. 2013;20(suppl 1), 67
7. Wardle J, Adams A, Steel A, Frawley J (2013) Naturopaths perceptions and beliefs on professional regulation. *Forschende Komplementarmedizin* 20(suppl 1), 44

8. Frawley J, Steel A (2013) The use of Complementary and Alternative Medicine (CAM) for Inflammatory Bowel Disease: an Australian survey. *Forschende Komplementarmedizin* 20(suppl 1), 68
9. Steel A, Frawley J (2013) Managing chronic degenerative joint conditions in naturopathic practice. *Forschende Komplementarmedizin* 20(suppl 1):108
10. Steel A, Sibbritt D, Adams J, Daley J. P04.80. Navigating the divide: women's engagement with conventional and complementary medicine in pregnancy. *BMC Complement Altern Med*. 2012;12(Suppl 1), P350

# Abbreviations

ABS – Australian Bureau of Statistics

AHPRA – Australian Health Practitioners Regulation Agency

AIDS – Acquired Immunodeficiency Syndrome

AIHW – Australian Institute of Health and Welfare

ALSWH – Australian Longitudinal Study on Women’s Health

ART – assisted reproductive technologies

ARTG – Australian Register of Therapeutic Goods

ASGC - Australian Standard Geographical Classification

CAM – Complementary and alternative medicine

CI – Confidence interval

GP – General practitioner

HIV – Human immunodeficiency virus

HRT - hormone replacement therapy

HSR – Health services research

NCCAM - National Centre for Complementary and Alternative Medicine’s

NIH – National Institute of Health

OR – Odds ratio

PHI – private health insurance

RCT – Randomised-controlled trial

TGA – Therapeutic Goods Administration

US – United States

UK – United Kingdom

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# Abstract

**Aim:** The aim of this project is to explore the use of complementary and alternative medicine (CAM) products and services by women during pregnancy, with a focus upon: determining the current prevalence of CAM use and examining the determinants, characteristics and attitudes of women who use CAM; investigating the utilisation of various information sources used by pregnant women to make decisions about the use of CAM; and examining the extent to which pregnant women choose to self-prescribe certain CAM products.

**Method:** The study sample was obtained via the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH is a longitudinal study of women in three age groups ("young" 18-23, "mid age" 45-50 and "older" 70-75 years), who were randomly selected from the Australian national Medicare database to investigate multiple factors affecting health and wellbeing of women over a 20-year period. This research project analyses data from a sub-study survey administered in 2010. Participants in the sub-study were identified based upon their reporting of being pregnant or as having recently given birth in the 2009 ALSWH Survey 5 (n=2,316) of the young cohort. A total of 1,835 women responded to the sub-study survey and were included in the analysis (79.2% response rate).

**Results:** CAM use during pregnancy is high with 91.7% (n=1,485) of women using a CAM product (52.0% excluding vitamins and minerals) and 48.1% (n=623) of women

consulting a CAM practitioner. CAM practitioner visits were more likely for selected pregnancy-related health concerns, namely back pain or backache, and neck pain. Employment was also found to be predictive of pregnant women's visits to a CAM practitioner. Significant health history and demographic predictors of CAM product use were tiredness and fatigue, embarking on preparation for labour and having a university education. Further analysis found that of the 447 women who did consult a CAM practitioner prior to pregnancy 62.4% (n=279) continued to utilise a CAM practitioner during pregnancy. Certain attitudes were found to be associated with women who use CAM products during pregnancy and women were more likely to use herbal medicine if they suffered from anxiety, sleeping problems and/or fatigue. The self-prescription of herbal medicine was also found to be widespread. Of the women deciding whether or not to visit a CAM practitioner, nearly half (48%, n=493) were influenced by their own personal experience of CAM and 43% (n=423) by family and friends.

Conclusion: CAM use by women during pregnancy is high. Maternity health care professionals need to inquire about CAM use during routine antenatal visits in order to ensure safe maternal outcomes.

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pregnant women. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 53(4):347-52. 357

**Appendix 5:** Frawley J, Adams J, Steel A, Broom A, Gallois C, Sibbritt D (2014). Majority of women are influenced by non-professional information sources when deciding to consult a complementary and alternative medicine (CAM) practitioner during pregnancy. *Journal of Alternative and Complementary Medicine*, 20(7): 571-577. 365

**Appendix 6:** Frawley J, Adams J, Steel A, Broom A, Gallois C, Sibbritt D (2015). Women's Use and Self-Prescription of Herbal Medicine during Pregnancy: An Examination of 1,835 Pregnant Women. *Women's Health Issues* (doi: 10.1016/j.whi.2015.03.001 Epub ahead of print). 372